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## WHAT IS CLAIMED IS:

1.A chiral chelating agent having a formula (1) as follows and an enantiomeric isomer thereof:

Me
$$N = \begin{pmatrix} Me \\ N - (CH_2)_n \end{pmatrix} = \begin{pmatrix} R^2R^1N & O \\ NR^1R^2 & Me \end{pmatrix}$$

$$Me$$

$$Me$$

- wherein R<sup>1</sup> and R<sup>2</sup> represent H, methyl, ethyl, a primary, secondary or tertiary straight, branched or cyclic alkyl group having 3-7 carbon atoms, a heterocyclic or aromatic group, an aromatic group substituted at the 2-, 3- or 4-position, an aromatic-like group, or a naphthyl or naphthyl-derived group, and n is an integer between 0 and 4.
- 2.A chiral chelating agent having a formula (2) as follows and an enantiomeric isomer thereof:

wherein R<sup>1</sup> and R<sup>2</sup> represent H, methyl, ethyl, a primary, secondary or tertiary straight, branched or cyclic alkyl group having 3-7 carbon atoms, a heterocyclic or aromatic group, an aromatic group substituted at the 2-, 3- or 4-position, an aromatic-like group, or a naphthyl or naphthyl-derived group, and n is an integer between 0 and 4.

3.A chiral chelating agent having a formula (3) as follows and an enantiomeric isomer thereof:

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wherein R represents H, methyl, ethyl, a primary, secondary or tertiary straight, branched or cyclic alkyl group having 3-7 carbon atoms, a heterocyclic or aromatic group, an aromatic group substituted at the 2-, 3- or 4-position, an aromatic-like group, or a naphthyl or naphthyl-derived group, and n is an integer between 0 and 4.

4.A chiral chelating agent having a formula (4) as follows and an enantiomeric isomer thereof:

$$\begin{array}{c|c}
Me & RO & O \\
H & H & H & H \\
O & OR & Me
\end{array}$$

$$\begin{array}{cccc}
H & Me & Me
\end{array}$$

$$\begin{array}{ccccc}
Me & Me & Me
\end{array}$$

wherein R represents H, methyl, ethyl, a primary, secondary or tertiary straight, branched or cyclic alkyl group having 3-7 carbon atoms, a heterocyclic or aromatic group, an aromatic group substituted at the 2-, 3- or 4-position, an aromatic-like group, or a naphthyl or naphthyl-derived group, and n is an integer between 0 and 4.

5.A chiral chelating agent having a formula (5) as follows and an enantiomeric isomer thereof:

Me
$$\begin{array}{c}
Me \\
N^{-}(CH_{2})_{n} \\
N^{-}(CH_{2})_{n}
\end{array}$$
Me
$$\begin{array}{c}
N^{2}R^{1}NO_{2}S \\
N^{-}(CH_{2})_{n} \\
N^{-}(CH_{2})_{n}
\end{array}$$
Me
$$\begin{array}{c}
Me \\
Me
\end{array}$$

wherein R<sup>1</sup> and R<sup>2</sup> represent H, methyl, ethyl, a primary, secondary or tertiary straight, branched or cyclic alkyl group having 3-7 carbon atoms, a heterocyclic or aromatic

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group, an aromatic group substituted at the 2-, 3- or 4-position, an aromatic-like group, or a naphthyl or naphthyl-derived group, and n is an integer between 0 and 4.

6.A chiral chelating agent having a formula (6) as follows and an enantiomeric isomer thereof:

Me
$$\begin{array}{c}
Me \\
N \\
N \\
(CH_2)_n \\
N \\
Me
\end{array}$$
(6)

wherein R<sup>1</sup> and R<sup>2</sup> represent H, methyl, ethyl, a primary, secondary or tertiary straight, branched or cyclic alkyl group having 3-7 carbon atoms, a heterocyclic or aromatic group, an aromatic group substituted at the 2-, 3- or 4-position, an aromatic-like group, or a naphthyl or naphthyl-derived group, and n is an integer between 0 and 4.

7.A chiral chelating agent having a formula (7) as follows and an enantiomeric isomer thereof:

wherein R<sup>1</sup> and R<sup>2</sup> represent H, methyl, ethyl, a primary, secondary or tertiary straight, branched or cyclic alkyl group having 3-7 carbon atoms, a heterocyclic or aromatic group, an aromatic group substituted at the 2-, 3- or 4-position, an aromatic-like group, or a naphthyl or naphthyl-derived group, and n is an integer between 0 and 4.

8.A chiral chelating agent having a formula (8) as follows and an enantiomeric isomer thereof:

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$$\begin{array}{c|c}
Me & Me \\
N & N & N
\end{array}$$

$$\begin{array}{c}
N & N & N & N & N \\
N & N & N & N
\end{array}$$

$$\begin{array}{c}
N & N & N & N & N \\
N & N & N & N
\end{array}$$

$$\begin{array}{c}
N & N & N & N & N \\
N & N & N & N
\end{array}$$

$$\begin{array}{c}
N & N & N & N & N \\
N & N & N & N
\end{array}$$

$$\begin{array}{c}
N & N & N & N & N \\
N & N & N & N
\end{array}$$

$$\begin{array}{c}
N & N & N & N & N \\
N & N & N & N
\end{array}$$

$$\begin{array}{c}
N & N & N & N & N \\
N & N & N & N
\end{array}$$

$$\begin{array}{c}
N & N & N & N & N \\
N & N & N & N
\end{array}$$

$$\begin{array}{c}
N & N & N & N & N \\
N & N & N & N
\end{array}$$

$$\begin{array}{c}
N & N & N & N & N \\
N & N & N & N
\end{array}$$

$$\begin{array}{c}
N & N & N & N & N \\
N & N & N & N
\end{array}$$

$$\begin{array}{c}
N & N & N & N & N \\
N & N & N & N
\end{array}$$

$$\begin{array}{c}
N & N & N & N & N \\
N & N & N & N
\end{array}$$

$$\begin{array}{c}
N & N & N & N & N \\
N & N & N & N
\end{array}$$

$$\begin{array}{c}
N & N & N & N & N \\
N & N & N & N
\end{array}$$

$$\begin{array}{c}
N & N & N & N & N \\
N & N & N & N
\end{array}$$

$$\begin{array}{c}
N & N & N & N & N \\
N & N & N & N
\end{array}$$

$$\begin{array}{c}
N & N & N & N & N \\
N & N & N & N
\end{array}$$

$$\begin{array}{c}
N & N & N & N & N \\
N & N & N & N
\end{array}$$

wherein R<sup>1</sup> and R<sup>2</sup> represent H, methyl, ethyl, a primary, secondary or tertiary straight, branched or cyclic alkyl group having 3-7 carbon atoms, a heterocyclic or aromatic group, an aromatic group substituted at the 2-, 3- or 4-position, an aromatic-like group, or a naphthyl or naphthyl-derived group, and n is an integer between 0 and 4.

9.A chiral chelating agent having a formula (9) as follows and an enantiomeric isomer thereof:

wherein R represents H, methyl, ethyl, a primary, secondary or tertiary straight, branched or cyclic alkyl group having 3-7 carbon atoms, a heterocyclic or aromatic group, an aromatic group substituted at the 2-, 3- or 4-position, an aromatic-like group, or a naphthyl or naphthyl-derived group, and n is an integer between 0 and 4.

10.A chiral chelating agent having a formula (10) as follows and an enantiomeric isomer thereof:

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wherein R represents H, methyl, ethyl, a primary, secondary or tertiary straight, branched or cyclic alkyl group having 3-7 carbon atoms, a heterocyclic or aromatic group, an aromatic group substituted at the 2-, 3- or 4-position, an aromatic-like group, or a naphthyl or naphthyl-derived group, and n is an integer between 0 and 4.

11.A chiral chelating agent having a formula (11) as follows and an enantiomeric isomer thereof:

wherein R<sup>1</sup> and R<sup>2</sup> represent H, methyl, ethyl, a primary, secondary or tertiary straight, branched or cyclic alkyl group having 3-7 carbon atoms, a heterocyclic or aromatic group, an aromatic group substituted at the 2-, 3- or 4-position, an aromatic-like group, or a naphthyl or naphthyl-derived group, and n is an integer between 0 and 4.

12.A chiral chelating agent having a formula (12) as follows and an enantiomeric isomer thereof:

Me
$$Me$$

$$SO_2NR^1R^2$$

$$SO_2NR^1R^2$$

$$Me$$

$$Me$$

$$Me$$

$$Me$$

wherein R<sup>1</sup> and R<sup>2</sup> represent H, methyl, ethyl, a primary, secondary or tertiary straight, branched or cyclic alkyl group having 3-7 carbon atoms, a heterocyclic or aromatic group, an aromatic group substituted at the 2-, 3- or 4-position, an aromatic-like group, or a naphthyl or naphthyl-derived group, and n is an integer between 0 and 4.

13.A chiral chelating agent having a formula (13) as follows and an enantiomeric isomer thereof:

$$\begin{array}{c|c}
Me & Me \\
N & (CH_2)_n & N \\
N & Me
\end{array}$$

$$\begin{array}{c|c}
N & Me
\end{array}$$

$$\begin{array}{c|c}
Me & Me
\end{array}$$

$$\begin{array}{c|c}
Me & Me
\end{array}$$

wherein n is an integer between 0 and 4.

5 14.A chiral chelating agent having a formula (14) as follows and an enantiomeric isomer thereof:

wherein n is an integer between 0 and 4.

15.A chiral chelating agent having a formula (15) as follows and an enantiomeric isomer thereof:

wherein n is an integer between 0 and 4.

16.A chiral chelating agent having a formula (16) as follows and an diastereomeric or an enantiomeric isomer thereof:

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wherein X represents an oxygen atom or a nitrogen atom; R<sup>1</sup>, R<sup>2</sup> R<sup>3</sup> and R<sup>4</sup> represent H, methyl, ethyl, a primary, secondary or tertiary straight, branched or cyclic alkyl group having 3-7 carbon atoms, a heterocyclic or aromatic group, an aromatic group substituted at the 2-, 3- or 4-position, an aromatic-like group, a naphthyl or naphthylderived group or the above groups substituted with at least a halogen.

17.A chiral chelating agent having a formula (17) as follows and an diastereomeric or an enantiomeric isomer thereof:

Me Me Me OH OH OH 
$$R^3$$
  $R^4$   $R^4$ 

wherein X represents an oxygen atom or a nitrogen atom; R<sup>1</sup>, R<sup>2</sup> R<sup>3</sup> and R<sup>4</sup> represent H, methyl, ethyl, a primary, secondary or tertiary straight, branched or cyclic alkyl group having 3-7 carbon atoms, a heterocyclic or aromatic group, an aromatic group substituted at the 2-, 3- or 4-position, an aromatic-like group, a naphthyl or naphthylderived group or the above groups substituted with at least a halogen.

- 18.A chiral catalyst formed from the chiral chelating agent of any one of claims 1 to 17 and a metal.
- 19. The chiral catalyst of claim 18, wherein the metal comprises an alkali metal, an alkaline earth metal or a transition metal.
- 20. The chiral catalyst of claim 19, wherein the transition metal comprises a lanthanide metal.
  - 21. The chiral catalyst of claim 20, wherein the lanthanide metal comprises lanthanum (La) or ytterbium (Yb).
    - 22. The chiral catalyst of claim 18, which is used in a Baylis-Hillman reaction.
- 23. The chiral catalyst of claim 18, which is used in a chiral alkylation, a chiral reduction, a chiral cyclization including a [2+2], a [3+2], a [4+2] or a [2+2+2] cyclization, a chiral hydrogenation, a chiral epoxidation, a chiral cyclization of propane, a chiral aziridination, a alkylation, a chiral dialkylation, a chiral hyroxyamination, a chiral amination, an Aldol reaction or a Michael addition reaction.

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